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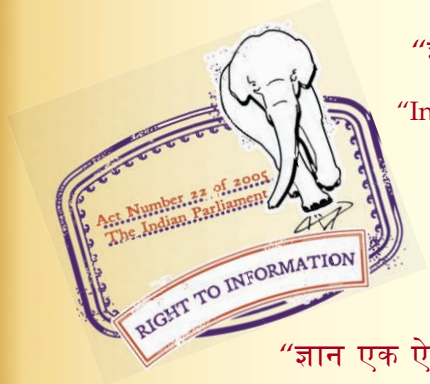
IS 4424 (1967): timber for use in coal mines [CED 9: Timber and Timber Stores]



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Indian Standard

SPECIFICATION FOR USE OF TIMBER IN COAL MINES

UDC 674·03: 622·33

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *February* 1968

Indian Standard

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AMENDMENT NO. 1 AUGUST 1992
TO
IS 4424 : 1967 SPECIFICATION FOR USE OF TIMBER IN COAL MINES

(*Cover page, pages* 1 *and* 3) — Substitute the following for the existing title of the standard:

'*Indian Standard*

SPECIFICATION FOR TIMBER FOR USE IN COAL MINES'

(ÇED 9)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR USE OF TIMBER IN COAL MINES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 7 December 1967, after the draft finalized by the Timber Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 As timber is extensively used for various purposes in mining, such as pit props, bars, cogging sleepers, tram sleepers, bantam and ladders, a need is felt to have a standard for use of timber in the coal mining in the first instance.

0.3 The prevailing conditions in mines are generally humid and hot. Some mines are very wet, especially the coal winning places where hydraulic sand stowing is practised. Indian coals are liable to spontaneous heating which subsequently may cause fire in the coal. Besides, some mines are gassy which may cause explosion and subsequent fire. Thus to reduce the spread of any fire, the timbers used in the mines shall also be treated for fire resistance unless it is otherwise considered safe by the users.

0.4 In the formulation of this standard due weightage has been given to international co-odination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.5 This standard contains clause **4.2.6** which permits the purchaser to use his option for selection to suit his requirements.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final values, observed or calculated, expressing the results of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off values should be the same as that of the specified values in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers the requirements of timber with regard to species, sizes and their treatment when used in coal mines.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions and those given in IS : 707-1958* shall apply.

2.1 **Bantam** — A piece of timber of about 15 × 20 cm in cross-section and about four metres in length (*see* Fig. 1) used for supporting power cables, pipes, etc.

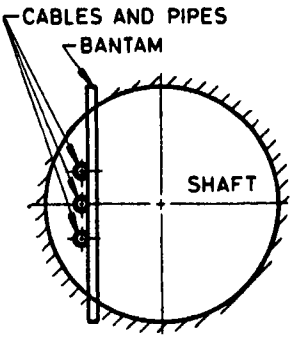

FIG. 1 A BANTAM IN A SHAFT

2.2 **Bar** — A prop either of full sections or split along length when used as a beam to support the roof (*see* Fig. 2).

2.3 **Cogging Sleeper or Chock** (*see* **Fig. 3**) — A piece of timber, of about 10 × 15 cm in cross-section of half-round in cross-section of about 15 cm diameter and about one metre in length.

2.4 **Eccentricity** — Deviation of a prop from straightness.

2.5 **Prop** — Long solid, fairly straight stem of a tree approximately circular in cross-section (*see* Fig. 2, 4 and 5).

2.6 **Tram Sleeper (or Track Sleeper)** — A piece of timber of about 5 × 10 cm in cross-section or of half-round in cross-section of about 10 cm diameter, and about one metre in length, used for laying out trolly line.

*Glossary of terms applicable to timber, plywood and joinery.

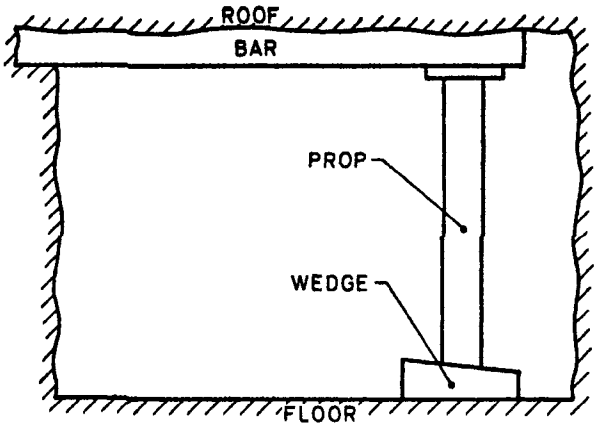

FIG. 2 PROPS AND BARS IN A HEADING

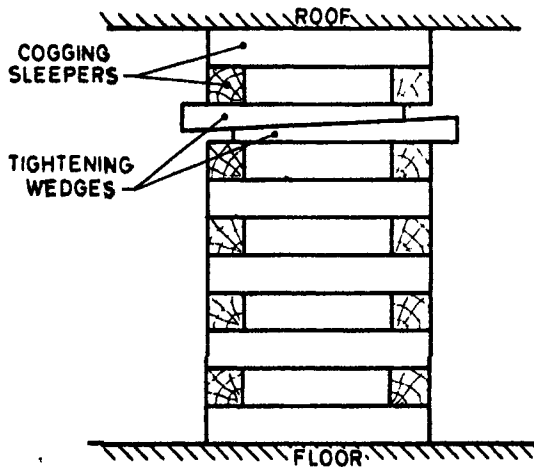

FIG. 3 CHOCK TO SUPPORT ROOF IN A MINE

3. SPECIES OF TIMBER

3.1 Species of timber suitable for coal mining purposes shall be those given in Appendix A.

3.2 Species not specified in Appendix A shall not be supplied without prior consent in writing of the user.

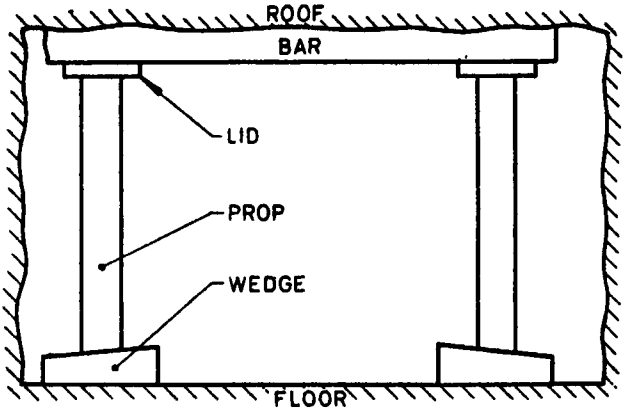

FIG. 4 TWO PROPS SUPPORTING A BAR IN A HEADING OR A ROADWAY

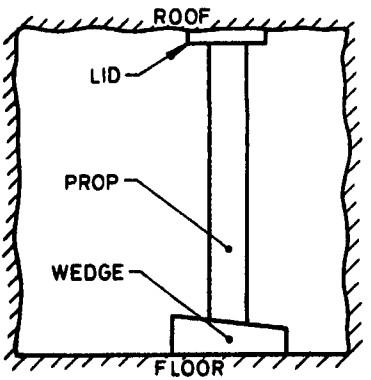

FIG. 5 A PROP WITH A LID SUPPORTING A WORKING FACE

3.3 The abbreviations used are based on IS : 1150-1966*.

4. MANUFACTURING REQUIREMENTS

4.1 All the mining timber shall be sawn square. The bar shall be completely removed and all the branches shall be dressed down flush with the stem. The top and bottom shall be sawn parallel to each other and perpendicular to the axis of the prop.

*Trade names and abbreviated symbols for timber species (*first revision*).

4.2 The dimensions of various members shall be as follows.

4.2.1 *Props* — Props shall be of the following sizes and any other which may be required by the users.

Diameter, cm	10 to 12·0
Length, cm	100 to 500

4.2.2 *Bars*

4.2.2.1 Bars of circular cross-section shall be of the same dimensions as for props in **4.2.1.**

4.2.2.2 Bars of half-round in cross-section shall have the following dimensions:

Diameter, cm	10 to 25
Length, cm	100 to 400

4.2.2.3 Bars of rectangular cross-sectional area shall have the following dimensions:

Breadth, cm	5 to 10
Width, cm	10 to 25
Length, cm	100 to 400

4.2.3 *Cogging Sleeper or Chock* — Cogging sleepers shall be of the following dimensions:

Breadth, cm	10 to 15
Width, cm	5 to 10
Length, cm	50 to 100

4.2.4 Tram sleepers (rectangular in cross-section) shall be of the following dimensions:

Breadth, cm	5 to 10
Width, cm	15 to 20
Length, cm	About 100

4.2.4.1 *Half-round in cross-section* — These sleepers shall be of the following dimensions:

Diameter, cm	10 to 15
Length, cm	About 100

4.2.5 *Bantam* — Bantam shall be of the following dimensions:

Breadth, cm	10 to 15
Width, cm	15 to 25
Length, cm	400 to 600

4.2.6 Timber of any other sizes and for any other purposes may also be supplied as required by the users.

4.3 Measurements

4.3.1 Length of the members shall be measured between the extreme ends correct to one centimetre.

4.3.2 The cross-section dimension (diametre, breadth, width) shall be measured at the centre portion of the length of the member correct to 2 mm.

5. DEFECTS

5.1 Defects Totally Prohibited — The following defects in the timber for use in mines shall be totally prohibited:

a) Sap rot,
b) Hollows in the top of a prop,
c) Cross breaks, and
d) Large holes.

5.2 Defects Permitted to a Limited Extent

5.2.1 *Dead Streaks* — Timber for use in mines shall be free from dead streaks that are wider than the one-fourth of the circumference of the timber at the point of measurement.

5.2.2 *Decay* — Timber for use in mines shall be free from decay and visible evidence of the presence of wood rotting fungi.

5.2.3 *Checks and Splits* — Timbers for use in mines shall not have in the end surface splits or checks extending from one point of the periphery to another point or more than one-tenth of the length along the surface.

5.2.4 *Hollow Heart* — No timber for use in mines shall have hollow heart, the diameter of which exceeds one-fourth the end diameter or the depth of which exceeds one-tenth of the length. The depth of hollow heart shall be measured from the end surface.

5.2.5 *Rot* — Rot in pith may be permitted in the end surface provided the aggregate of rot and hollow heart does not exceed 25 percent of the entire end surfaces.

5.2.6 *Ring Shake* — Complete ring shakes on the end surface may be permitted provided the diameter of the ring which they follow is not more than one-third of the diameter at the end, and provided the depth is not more than one-tenth of the length.

5.2.7 *Insect Damage* — Timber for use in mines shall be free from insect damage except that total number of pin holes to the extent of 10 in every 1 000 cm^2 may be permitted and the concentration of such holes shall be not greater than 10 in any 25 cm^2.

5.2.8 *Knots*

5.2.8.1 *Unsound knots* — Timber for use in mines shall be free from unsound knots over 20 mm in diameter.

5.2.8.2 *Sound knots* — The diameter of any single sound knot or the sum of the diameters of all sound knots in any section, 30 cm in length, between the two ends of the props, bars, cogging, sleepers, tram sleepers and bantam shall not exceed the following:

a) Maximum diameter of any single sound knot 75 mm, and

b) Sum of maximum diameters of all sound knots 200 mm.

NOTE — Knots of diameter 10 mm and under shall be ignored in applying the limitations for the sum of diameters. The sum of maximum diameters of all sound knots across any section of the timber for use in mines shall not exceed 25 percent of circumference at that section.

6. PRESERVATIVES

6.1 The treatments to be given shall conform to IS : 401-1967*.

7. DESIGN

7.1 Props shall be designed as a strut column as given in IS : 883-1966†.

7.2 Bars shall be designed as a beam supported at two ends with uniformly distributed load or several point-loads.

7.3 Cogging sleepers shall be designed for areas under compression as per IS : 883-1966†.

7.4 Tram sleepers shall be designed as under **7.3**.

7.5 Bantam shall be designed as a beam under several point-loading.

8. MARKING

8.1 Each timber shall be marked in a suitable manner with the manufacturer's identification mark or initials.

*Code of practice for preservation of timber (*second revision*).
†Code of practice for design of structural timber in building (*second revision*).

8.1.1 Each timber may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

APPENDIX A
(*Clause* 3.1)
SPECIES OF TIMBER RECOMMENDED FOR USE IN MINES

SL NO.	SPECIES	TRADE NAME	ABBREVIATION
1.	*Acacia arabica* Willd.	**babul**	BAB
2.	*Acacia catechu* Willd.	**khair**	KHA
3.	*Adina cordifolia* (Roxb.) Hook. f.	**haldu**	HAL
4.	*Albizzia chinensis* (Osbeck) Merr.	**siris**	SIR
5.	*Albizzia lebbeck* Benth.	**kokko**	KOK
6.	*Anogeissus latifolia* Wall.	**axlewood (bakli)**	AXL
7.	*Bridelia* retusa Spreng.	**kasi**	KAS
8.	*Casuarina equisetifolia* Linn.	**casuarina**	CAS
9.	*Diospyros* sp.	**ebony**	EBO
10.	*Lagerstræmia speciosa,* Pers.	**jarul**	JAR
11.	*Lagerstræmia lanceolata* Wall.	**benteak**	BEN
12.	*Lagerstræmia parviflora* Roxb.	**lendi**	LEN
13.	*Madhuca* sp.	**mahua**	MAU
14.	*Ougeinia dalbergioides* Benth.	**sandan**	SAD
15.	*Pterocarpus marsupium* Roxb.	**bijasal**	BIJ
16.	*Shorea robusta* Gærtn. f.	**sal**	SAL
17.	*Syzygium* sp.	**jaman**	JAM
18.	*Terminalia arjuna* W & A.	**arjun**	ARJ
19.	*Terminalia paniculata* Roth.	**kindal**	KIN
20.	*Terminalia tomentosa* Wight et Arn.	**laurel**	LAU

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The present technical activity of ISI is carried out through 8 Division Councils for Agricultural and Food Products; Chemical; Civil Engineering; Consumer Products; Electrotechnical; Mechanical Engineering; Structural and Metals; and Textile. All technical work relating to the formulation and revision of standards is done by committees appointed by and under the direction of their respective Division Councils. These committees consist of experts drawn from manufacturing units, technical institutions, purchase organizations and other concerned bodies.

To make available benefits of Indian Standards to the common man, ISI has introduced its Certification Marks Scheme under the *Indian Standards Institution (Certification Marks) Act, 1952*, as amended by the *Amendment Act, 1961*. According to this Act, quality goods conforming to Indian Standards can carry the ISI Certification Mark. This Mark is a third-party guarantee of quality of marked goods. Licences to use the ISI Certification Mark are granted to manufacturers using reliable methods of quality control subject to overall inspection by ISI.

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